Dealer address details:

INSTALLATION MANUAL

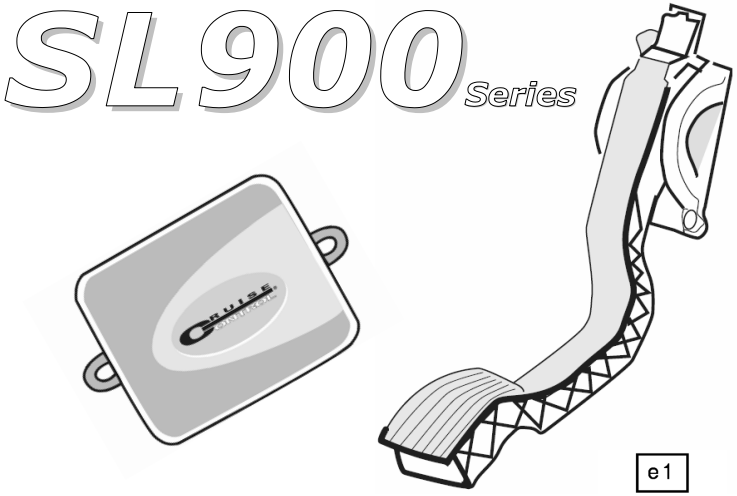
CRUISE CONTROL

&

SPEED LIMITER

AP900 Series

SL900 Series



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NOTES:

The LED does not flash with a TACH signal input
Incorrect TACH signal. Check the signal using either a voltmeter or an oscilloscope. Make certain that the peak voltage of the signal is between the limits of 6v to 250V and in the frequency range of 6Hz-488Hz.

Once you have checked that the TACH signal is correct, test the signal again at the cruise control electronic module. Place the Red voltmeter lead or oscilloscope lead on the Yellow wire of the electronic module connector and the other lead to earth. Make certain you have the same signal at the electronic module.

If not, check over your connections and check if the Yellow wire is damaged or broken.

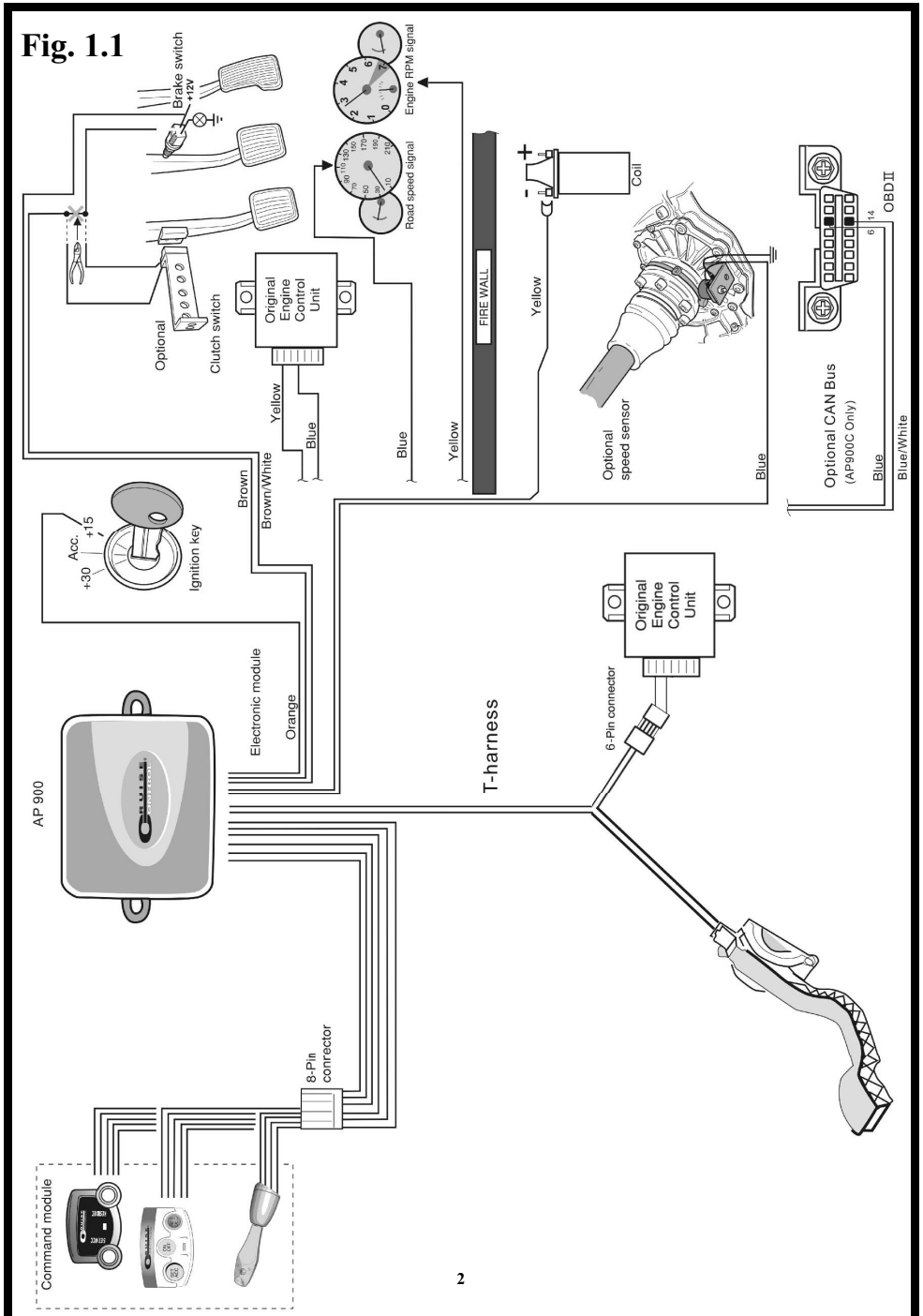
The LED does not flash with a speed signal input
Incorrect Speed signal. Check the speed signal using either a voltmeter or an oscilloscope. Make certain that the peak voltage of the signal is between the limits of 1.5v to 24v and is in the frequency range 6Hz to 8.5KHz.

Once you have checked that the Speed signal is correct, test the signal again at the cruise control electronic module. Place the Red voltmeter lead or the oscilloscope lead on the Blue wire of the electronic module connector and the other lead to earth. Make certain you have the same signal at the electronic module. If not, check over your connections and check if the Blue wire is damaged or broken.

Cannot enter the Setup mode
Repeat the setup procedure and press the ON key quickly (2 Lo beeps follow) to switch the Cruise Control ON. Pressing the ON key longer (1 Lo beep + 2 Hi beeps follow) will activate the Speed Limiter. The setup cannot be done in speed limiter mode

The car give error codes on the dashboard
Check the CAN-High and CAN-Low connections on
CAN settings can be faulty. Follow the AP900C / SL900C SET-UP procedure at chapter 6.1.
The pedal setup can be faulty. Follow the manual pedal setup procedures 6.2.2, 6.2.3 and 6.2.9.

Fig. 1.1

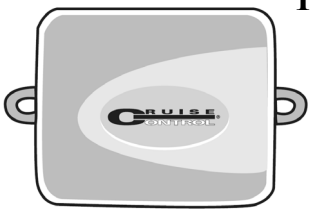


1

KIT CONTENTS:

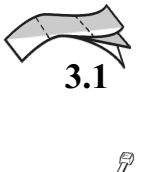
ITEM	PART NO	QTY	DESCRIPTION
1	A10.2014940	1	ELECTRONICS MODULE
2	190.5000400	1	MAIN WIRING HARNESS

1



2

3	A90.9114940	1	Hardware kit AP900
3.1		1	Double sided tape
3.2		1	Grommet
3.3		10	Wire tie
3.4		2	Screw 8x1/2
3.5		1	Fuse 3A
3.6	180.9970400	2	Tap connector (AP900C/SL900C only)
3.7	231.0004530	1	Installation manual



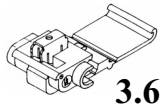
3.1

3.2

3.3

3.4

3.5



3.6

11

TROUBLE SHOOTING GUIDE:

This section of the manual includes a list of potential problems and a list of recommended checks to perform to solve these problems.

The LED on the electronic module does not light when the command module buttons are pressed.
Check the 8-pin command module connector from the electronic module and make certain that it is connected correctly to the command module.
Check the colour code on the command module connector and make certain that you have inserted the terminals into the command module correctly. If these are inserted correctly then check the main electronic module power supply and earth connection. The Orange wire should have the battery voltage (+12V) when the ignition is switched on and the Green wire should have earth at all times.

The LED on the electronic module does not illuminate when the brake is depressed.
Check if the LED on the electronic module illuminates when the command module buttons are pressed. If not, check the main electronic module power supply. The Orange wire should have the battery voltage (+12V) when the ignition is switched on.

Use a Voltmeter to check the connections to the brake switch. One Brown wire from the electronic module should be connected to a brake light switch wire, which is either permanent feed, or an ignition switched feed. The other Brown wire should be connected between the brake light bulb and the brake light switch. You will therefore read earth through the brake light bulb when the brake pedal is not pressed and the battery voltage (+12V) when the brake pedal is pressed. The two Brown wires are interchangeable. Some brake light circuits will have an ignition switched feed, so test the wires with the ignition switch in the ON position.

For safety purposes, the Cruise Control will not work if you have a problem with the vehicles original brake light circuit. Therefore, test the brake lights and make certain they are operating correctly.

10

ROAD TEST:

Start your vehicle and turn the speed limit or cruise control on using the command module ON/OFF button.

To switch the Cruise Control on Press the ON key on the command module for less than 1 second. The cruise control will respond with 2 low tone beeps and the light on the command module will illuminate green.

Then driving at around 40 Km/Hr (25MPH) press and release the SET/ACC button and you should feel the cruise control take over. The lowest speed that your cruise control will operate is the minimum engage speed, this should be around 40 Km/Hr (25 MPH). The cruise control should now engage smoothly and maintain a stable vehicle speed.

To switch the Speed Limiter on Press the ON key on the command module for more than 1 second. The speed limiter will respond with 1 low and 2 high tone beeps and the light on the command module will illuminate green.

When the ON/OFF button is pressed more than 1.2 seconds, it sounds three tone beeps and lights up the green led, which enables the variable speed limit mode. Then driving at around 40KM/H (25MPH) press and release the SET/ACC button and you should feel the speed limit control take over. The lowest speed that your speed limit control will operate is the minimum engage speed, this should be around 40 KM/H (25 MPH). The speed limit control should now engage smoothly and let you not over the variable limit speed.

Sensitivity adjustments:

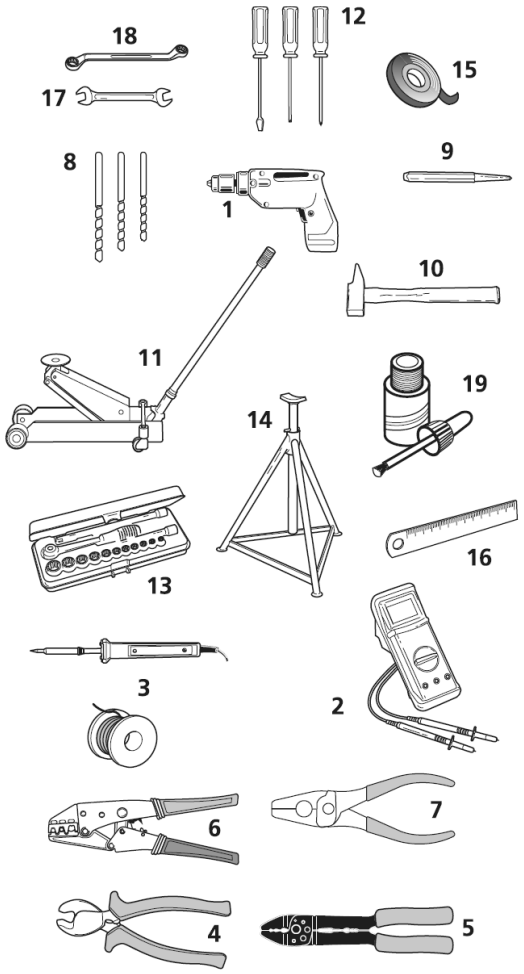
If the cruise control does not engage smoothly or if the cruise control gains or looses speed while cruising you can make adjustments to the sensitivity settings of the cruise control. When the cruise control is engaged and gains speed, acts erratically or seems too responsive, you can decrease the GAIN factor. If the cruise control loses speed or seems to be sluggish in response you can increase the GAIN factor.

All the sensitivity settings can be adjusted in SET UP MODE, please refer to the flowchart (Fig.6.3).

2

TOOLS REQUIRED:

It is strongly recommended to solder all electrical connections ensuring a reliable connection.



1 Electric drill
2 Volt meter
3 Soldering iron + solder
4 Wire cutters
5 Strippers
6 Crimping tool
7 Pair of pliers
8 Drill bits
9 Center punch
10 Hammer
11 Floor jack
12 Screw driver set
13 Socket set
14 Axle stands
15 Insulation tape
16 Measure
17 Spanner set
18 Ring spanner set
19 Wax sealant

3

ELECTRONICS MODULE LOCATION:

Always mount the electronics module in the passenger compartment of the car. Avoid places with excessive heat, dampness and high-tension leads. Common mounting locations are under the dashboard behind the glove compartment or the drivers- or passenger-side kick panels (Fig.3.1). Do not mount the electronics module in the engine compartment.
Temporarily install the electronics module in the selected position.
DO NOT firmly screw the electronic module down unless you have easy access to the electronics module. Once the installation has been finished, the electronics module can be screwed down in the selected position.

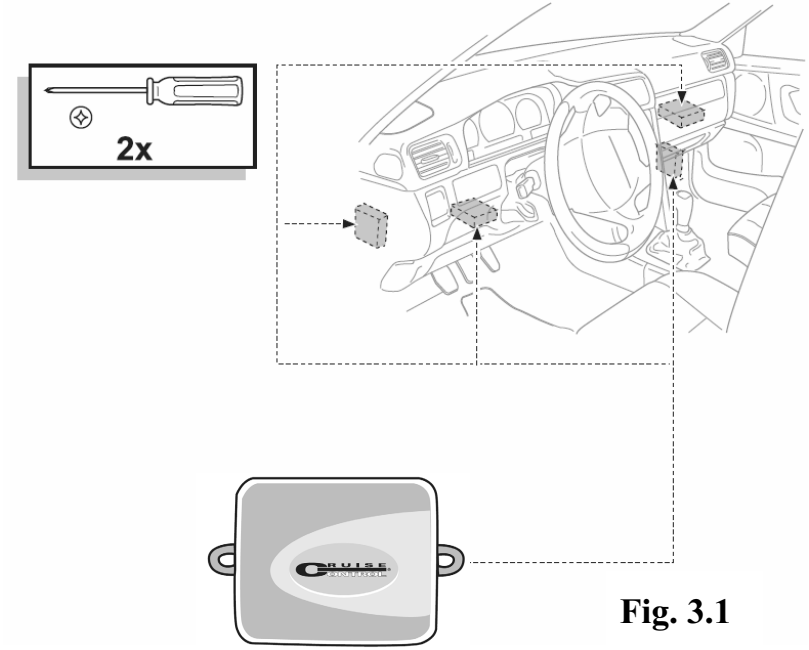


Fig. 3.1

Abnormal disengagement error tone beeps:

Follows the safety feature, while the Electronic Module detects the abnormal situation, the cruise control will disengage and sound numbers of Hi tone beeps to identify the error one time.

Beeps	Description
1	Any command module key is held over 20 seconds
2	Acceleration speed is over 9 Km/Hr per second abnormally
3	Speed drops down below 33 Km/Hr
4	Speed runs up over 250 Km/Hr
5	Speed drops down below 75% of existing setting speed
6	Speed runs up over 150% of existing setting speed
7	Pedal signals error
8	RPM increases abnormally

9

SAFETY FEATURES:

The cruise control is fitted with numerous safety features, which will disengage the cruise control in the following situations:

1. When pushing the brake pedal.
2. When pushing the command module COAST or CANCEL key.
3. When pushing the command module OFF key.
4. When pushing the clutch pedal.
5. When the automatic gearbox is placed in Neutral or Park.
6. When pressing any command module key over 20 seconds.
7. When turning the ignition OFF.
8. When engine revs increase faster than 150% of the set value.
9. When decelerating to 75% of the set speed (up-hill).
10. When accelerating to 150% of the set speed (down-hill).
11. When the brake fuse blows.
12. Minimum engage speed 33 km/hr.
13. Automatic disengages at less than 33 km/hr.
14. Maximum engage speed 240 km/hr.
15. Automatic disengages over 250 km/hr.

For a safe and economical operation, NEVER operate the Cruise Control in congested traffic or on wet or slippery roads.

⚠ **SAFETY NOTE:** Should a situation ever arise where action 1 through to 4 above will not disengage the cruise you can always turn the ignition OFF (action 7).

If your vehicle has a steering lock, be sure it cannot be activated when the ignition key is in the ignition lock or the car is in gear.

4

INPUT TYPE SELECTION

(optional for AP900C / SL900C only)

⚠ **NOTE: The following information is essential to complete the installation!!!**

This chapter is applicable for AP900C / SL900C only.

The AP900C Cruise Control and SL900C Speed Limiter can switch between two main operation modes, CAN-bus (digital) and Analogue. It will operate in default mode from the vehicle analogue signals like it's predecessor AP800 and additionally can operate too from the vehicle CAN-bus data. Refer to the AP900C application list or contact your distributor to define which operating mode is required for this particular installation.

Continue the installation as described in chapter 5.

5

WIRING HARNESS:

Once you have the location for the electronic module, it is possible to mount the main wiring harness of the Cruise Control. Use a voltmeter to find the right connections point in the car.

5.1 Orange wire (IGN Connection, +15)
(AP900 / SL900 / AP900C / SL900C)

Connect the ORANGE wire to a fused Ignition Switched **+12V** Feed.

NOTE: Check with a Voltmeter that the ignition switch feed you select supplies a full battery voltage. A suitable location is usually at the fuse box. It is not recommended to connect this orange wire to vehicle accessory (ACC) power wire. Make sure that the ignition key is in the off position before making the connection.

5.2 Blue + Blue/White (twisted pair, CAN-bus Connections)
(AP900C / SL900C)
Attach the BLUE wire of the twisted pair to an existing vehicle CAN High line. Attach the BLUE/WHITE wire of the twisted pair to an existing vehicle CAN Low line. Very often the vehicle CAN lines are present on the DLC (diagnostic Link Connector): DLC pin 6 – CAN HIGH, DLC pin 14 – CAN LOW. Use the enclosed two tab-connectors (chapter 1, item 3.6) or use soldering for the connections to the vehicle CAN lines.

5.3 Purple wire (Neutral Connection)
(AP900, optional for AP900C)

NOTE: Optional the purple wire can be connected for vehicle if the clutch signal is not present on the CAN-bus!

Step 2 : Learn the ACCEL / RES Key. Press and hold the brake pedal and the Electronic Module will respond with 2 Hi tone beeps. Then press and hold the **ACCEL/RES key** to set ACCEL/RES parameters. Release brake pedal to confirm the setting and the Electronic Module will respond with 2 Hi tone beeps. Release ACCEL/RES key.

Step 3 : Learn the CANCEL Key. Press and hold the brake pedal and the Electronic Module will respond with 3 Hi tone beeps. Then press and hold the **CANCEL key** to set CANCEL parameters. Release brake pedal to confirm the setting and the Electronic Module will respond with 3 Hi tone beeps. Release CANCEL key.

Step 4 : Learn the ON/OFF Key. Press and hold the brake pedal and the Electronic Module will respond with 4 Hi tone beeps. Then press and hold the **ON/OFF** key to set ON/OFF parameters. Release brake pedal to confirm the setting and the Electronic Module will respond with 4Hi tone beeps. Release ON/OFF key.

To exit the genuine command module initialization mode and to save the learning parameters, press and hold the SW1 key located on the side of the electronics Module PC Board for 4 seconds. The Electronic Module will respond with one Long tone beep.

NOTE: If there is no CANCEL or ON/OFF button on the command module, skip the step 3 and step 4. And exit the genuine command module initialization mode directly.
Usually genuine command modules are analog types, which have two wires or three wires. Refer to chapter 5.4 for the connections.

NOTE: Standard (LITE-ON) supplied command modules can only be programmed via 8.1 standard command module initialization procedure.

8

COMMAND MODULE INITIALIZATION MODES

The command module initialization mode is only required if you change the command module from the factory supplied unit to a genuine type or if you wish to restore the factory default values or if you like to switch the default ACCEL/SET type to DECEL/SET type command module.

8.1 STANDARD COMMAND MODULE INITIALIZATION

To enter the Standard Command Module Initialization Mode, press and hold the SW1 key located on the side of the Electronics Module for 4 seconds. The Electronic Module will respond with 5 Hi tone beeps.

Press the **SET key** on the command module to instruct the Cruise Control to operate in the ACCEL / SET mode. The Electronic module will respond with 2 Hi tone beeps and exit the Command Module Initialization mode. Press the **RES key** on the command module to instruct the Cruise Control to operate in the DECEL / SET mode. The Electronic module will respond with 2 low tone beeps and exit the Command Module Initialization mode.

8.2 GENUINE (OE) COMMAND MODULE INITIALIZATION

The genuine command module initialization mode is only required if you prefer to use a genuine command module instead of one of the standard available controls.

Enter the command module initialization mode: Press and hold the SW1 key located on the side of the electronics Module PC Board for 4 seconds while pressing the brake pedal. The Electronic Module will respond with 6 Hi tone beeps. Release the brake pedal and SW1 key, and the Electronic Module will respond with one Long tone beep.

Step 1 : Learn the DECEL / SET Key. Press and hold the brake pedal and the Electronic Module will respond with one Hi tone beep. Then press and hold **DECEL/SET key** to set DECEL/SET parameters. Release brake pedal to confirm the setting and the Electronic Module will respond with one Hi tone beep. Release DECEL/SET key.

The PURPLE wire can be connected at 3 different locations.

A - O.E Clutch switch.
B - Neutral or Park lamp (automatic **gearbox** only). Locate the switch which detects when the vehicle is in Neutral or Park.
C - Hand Brake on lamp. Locate the hand brake switch.

Connect the PURPLE wire to the wire that:

- switch to ground or
- lose ground or
- switch from ground to positive or
- switch from positive to ground

when the clutch pedal is depressed.

⚠ WARNING: CHECK THIS CONNECTION CAREFULLY AS AN INCORRECT CONNECTION COULD RESULT IN ENGINE DAMAGE.

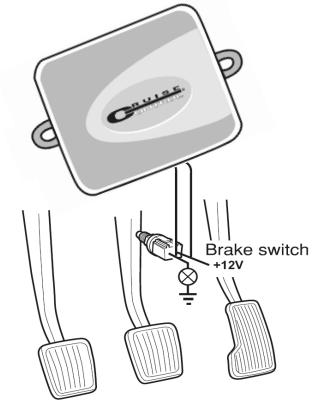
Note: The cruise control will **operate** normal if the PURPLE wire is not connected. If no connection is required cut and tape the PURPLE wire.

5.4 Brown wires (Brake Switch Connection)
(AP900 / SL900, optional for AP900C / SL900C)

⚠ NOTE: Not required if the CAN-bus is used!

Connect the BROWN wire to the permanent feed (+30) or ignition switched feed (+15) of the brake-switch.
Connect the BROWN-WHITE wire to the switch wire of the brake-switch. This wire should read the battery voltage (+12V) when the brake pedal is depressed and zero (0V) when released.

Fig. 5.1



Digital Brake Link connection: for vehicles with a digital brake link connect the BROWN wire to a permanent ignition switched feed (+15) at another location (for example fuse-box).

Connect the BOWN-WHITE wire to the wire that supplies voltage to the brake lights when the brake pedal is pushed. This wire will read ground through the brake light bulbs when the brake pedal is released and 12 volts when the brake pedal is pushed. Possible locations for this wire are the sill harnesses to the rear of the vehicle or fuse box.

⚠ **NOTE:** The BROWN and BROWN-WHITE wires are reversible. However as a safety feature, if the connections are not made securely and correctly the cruise will not work.

5.5 Blue wire (Speed Signal Connection)
(AP900 / SL900, optional for AP900C / SL900C)

⚠ **NOTE:** Not required if the CAN-bus is used!

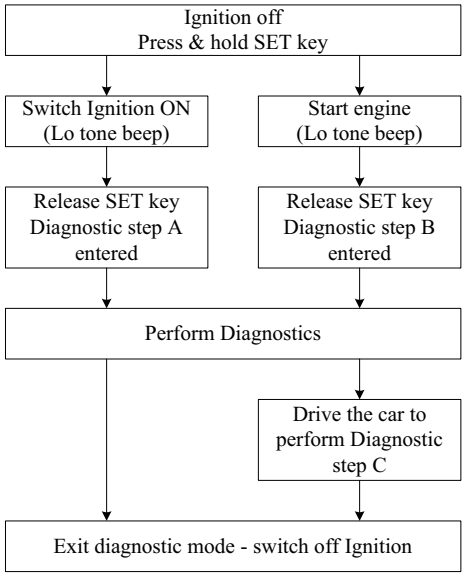
Connect the BLUE wire to a road speed signals wire with a voltage from1.5 volt to 24 volts and a frequency between 6Hz and 8.5KHz.
Identifying a suitable speed pulse signal.

A. Car Radio. If the car has an ISO connector the speed pulse will be in chamber 3 pin 1 or 5.
B. Electronic speedometer - rear of the instrument cluster, or loom to instrument cluster.
C. Gearbox speed sensor- mounted on the gearbox usually has 3 wires. A 12 volt (+15) supply, a Ground and a Signal wire.
D. Engine ECU road speed signal.

Diagnostic step C

This test is to check the speed signal input. When driving the car on the road, the speed signal can be checked by the GREEN LED and sounding of the BUZZER of the electronic module. The GREEN LED will flash and the buzzer will sound at a rate determined by the pulse frequency of the speed. While driving around 50 Km/Hr, the GREEN LED should flash once per second. Turn the ignition key off, after the car is stopped, to exit the diagnostic mode.

Fig. 7.1



• Brake Pedal

• Neutral Safety Switch

GREEN LED / HIGH tone beep (see diagnostic step B):

• Speed input when in Speed sensing mode

• Tach input when in Tach sensing mode

Any switch (control) input that is active for more than 10 seconds is automatically locked out to prevent that input from over-riding the detection of another switch input.

Diagnostic step B

NOTE: Diagnostic step B can only be executed if installation step 6.2.3 Manual Pedal Learning Mode has be completed correctly!
After the connections and functions are tested successfully in diagnostic step A, the test of operating the throttle pedal can be continued in diagnostic step B.

To enter diagnostic step B switch the ignition off. Then press and hold the SET key and start the engine. Release the SET key as soon as the engine runs.

Turn the cruise control ON and tap the SET key. The cruise control should now start to operate/open the throttle valve and the engine revs should increase accordingly. The throttle can be release instantly by pressing the bake or clutch pedal, or by moving the automotive gearbox into neutral position or using the by operating the COAST or ON/OFF key.

Keep the engine running and continue with Diagnostic step C or turn the ignition key off to exit diagnostic mode.

NOTE: For safety reasons the throttle cannot be operated for more than 66% of it full travel in diagnostic mode!

5.6 Yellow wire RPM / Tacho signal
(AP900 optional for AP900C)

NOTE: Not required if the CAN-bus is used!

If a Road Speed signal (blue wire) is being used on a vehicle with manual gearbox, over rev protection must be included to prevent damage to the engine. With the yellow wire connected the cruise control will disengage when the engine is revving up when the clutch is pressed with an engaged cruise control

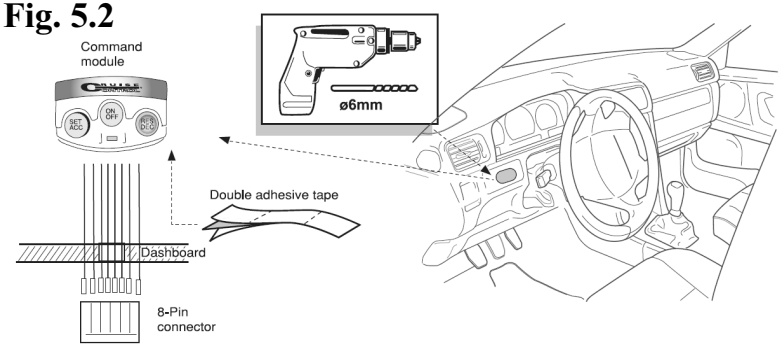
5.7 Command Module (Fig.5.2)
(AP900 / AP900C, optional for SL900 / SL900C)

A range of command modules is available to offer the most convenient (operating) solution for each application.

The command module must be mounted at a location, which guarantees safe operation in all circumstances. Suitable positions are on the dashboard or central console depending on the command module type.

For SL900 / SL900C the command module is required to perform the setup. Afterwards it can be used optional. See the user guide for further details.

Fig. 5.2

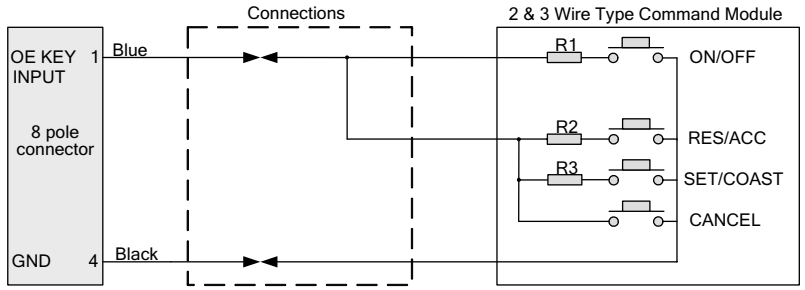


NOTE: Place the 8-pole connector on the wiring harness after the command module is placed on its location and after the wiring harness to routed to the Cruise Control ECU.

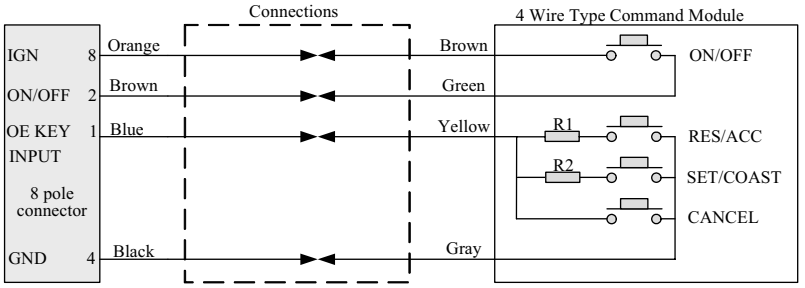
Genuine command modules operating trough two wires have to be connected (solder) to the command module wiring harness section of the main cruise control wiring harness (round 8-pole cable).

Fig. 5.3

2 Wire Type OE C/M



4 Wire Type OE C/M



7

DIAGNOSTIC MODE:

The Cruise Control has an integrated self-diagnostic mode. The self-diagnostic mode includes three steps test all connections and functions of the Cruise Control. Check your installation one to verify all connections are secure. Engage the handbrake and place the gearbox in neutral or park.

To activate the diagnostic mode press and hold the SET key while turning the vehicle Ignition switch ON. The buzzer will beep as long as you hold the SET key down. Release the SET key and the buzzer will stop sounding.

If the buzzer comes back ON again within one second, this indicates that one of the other control inputs is active when it should not be. By process of elimination, you can determine which control input is not functioning properly and repair the connection to that input.

Diagnostic step A

The diagnostic mode is provided to test the electrical connections to the Cruise Control module.
A bicolor diagnostic LED on the Electronic Module functions in this mode all of the time.
Since visual access to this Module is inconvenient once the module is mounted under the dash, a temporary diagnostic mode is provided that echoes the operation of the LED through the audio buzzer.
The LED and buzzer will activate whenever one of the following inputs is detected:

RED LED / LOW tone beep:

- Set Key
- Res Key
- Coast Key
- ON/OFF Key
- Memory buttons
- PCB button

ORANGE LED / LOW tone beep:

Module will respond with one Low tone beep for each press of the RES key. Release the BRAKE pedal and the Electronic Module will respond with 6 Hi tone beeps confirming the manual option adjustment mode. If you hear the incorrect number of Hi tone beeps, repeat the BRAKE pedal and RES key sequence.

Step 2: Press the SET or RES key to change the options. Please refer to the flow chart (Fig.6.5).

Step 3: Press the BRAKE pedal to save the chosen option and the Electronic Module will respond with 6 Hi tone beeps. **See section 6.2.9 to exit SET-UP mode.**

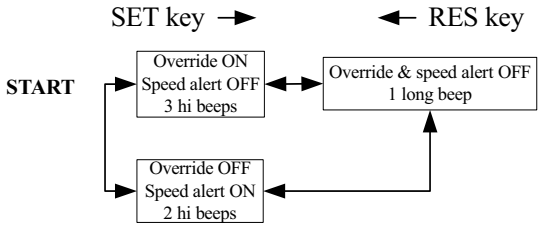


Fig. 6.5

6.2.9 Exit SET-UP Mode

To exit the SET-UP mode, press and hold the BRAKE pedal while pressing the SET key 4 times. The Electronic Module will respond with one long Hi tone beep to confirm the SET-UP mode has been terminated.

6

SETUP PROCEDURE:

The next setup / learn procedures are required to program the Cruise Control electronics to the vehicle. See also figures 6.1-6.3.

⚠ **CAUTION:** The voltage on the board net of some cars remains high for 30 seconds after the ignition is switched off. Wait till the LED on the Electronics Module is switched off before starting the setup procedure.

6.1 AP900C / SL900C SETUP (CAN-bus mode)

Step 1: To enter the Input Type Selection Mode, press and hold the SW1 key located on the side of the Electronics Module, then switch the ignition ON. The Electronics Module will respond with 2 Hi tone beeps. Then, press and hold both Brake and Clutch pedal/turn the Automatic Gearbox in neutral, then press the **SET Key** on the command module.

The setup/programming of the CAN-bus inputs and throttle pedal values will be completed automatically. The LED on the Electronics Module will blink during the setup procedure. 3 High tone beeps will confirm a successful CAN setup before the electronics module will switch immediately to the pedal test procedure. Release the Brake and Clutch pedal/turn the automatic gearbox back to Park position.

A long beep tone will follow if the CAN setup failed. Press the SET key to start a new attempt.

If the CAN setup does not succeed then created the analogue connections as described in chapter 5 and follow the setup as described in chapter 6.2.

Step 2: Test the pedal. The pedal idle position will be confirmed with a repeating 1 beep tone. Press the pedal slowly to halfway (50%) and a confirmation of a repeating 2 beeps tone should follow. Press the pedal finally to its end position (100%) and a repeating 3 beeps tone should follow. Now the test has been completed successfully.

If the pedal test gives a continuous repeating Hi-Lo beep tone then the pedal test failed. Press the SET key again and repeat above procedure. A new CAN search will be performed and a new match may follow that may have different parameters for the throttle pedal. If necessary, repeat this procedure several times. If the CAN search succeeded (3 beeps after the SET command) but the pedal test keeps failing then switch the ignition off and follow the manual pedal setup procedures 6.2.2, 6.2.3 and 6.2.9. See also figures.

Step 3: If the pedal test was successful, switch ignition OFF to exit the learning mode. The AP900C / SL900C set-up is completed and the Cruise control is ready for use.

⚠ **CAUTION:** Some pedals do not have consistent signal values near the full travel area. (presence of full-throttle switch). Therefore the test may fail. For this occasion press the pedal not further than 95% of its total travel at step 2.

Optional a fixed Speed Limit, a Speed Alert or an Override function for the manual speed limiter can be programmed following procedures 6.2.2, 6.2.7, 6.2.8 and 6.2.9.

Optional the Cruise Control parameters INIT (pickup timing) and GAIN (speed adjustment sensitivity) can be adjusted. This is ONLY required when the cruise control does not perform comfortable. Follow the procedures described in 6.2.5, 6.2.6 and 6.2.9.

6.2 AP900 / SL900 SET-UP
(analogue mode, optional for AP900C / SL900C)

6.2.1 Input type selection (for AP900C / SL900C only)

To convert AP900C from CAN-bus mode to Analogue mode enter the Input Type Selection Mode:

Press and hold the SW1 key located on the side of the Electronics Module, then switch the ignition ON. The Electronics Module will respond with 2 Hi tone beeps. Then, press **RES Key** on the command module to instruct the Cruise Control to change CAN-bus mode to Analogue mode. The Electronics module will respond with 4 Hi tone beeps and will exit the Input Type Selection Mode.

Electronic Module will respond with one Low tone beep for each press of the RES key. Release the BRAKE pedal and the Electronic Module will respond with 5 Hi tone beeps confirming the manual fixed limit adjustment mode. If you hear the incorrect number of Hi tone beeps, repeat the BRAKE pedal and RES key sequence.

Step 2: To set the LIMIT in this mode, press the **SET** key to increase the LIMIT or press the **RES** key to decrease the LIMIT. The LIMIT setting range is between 80 Km/Hr and 150 Km/Hr or No Limit. Refer to flow chart (Fig.6.4).

Step 3: To save the LIMIT setting, press the BRAKE pedal and the Electronic Module will respond with 5 Hi tone beeps. **See section 6.2.9 to exit SET-UP mode.**

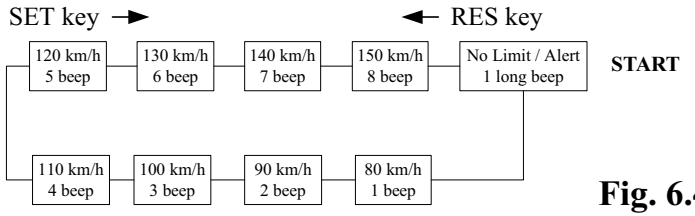


Fig. 6.4

6.2.8 Manual Override / Speed Alert Adjustment Mode (optional)

The Manual Override/Speed Alert adjustment mode allows enabling the Override function or a Speed Alert function. The override function enables the driver to 'override' a voluntary set speed limit (set by command module). It will not override a programmed 'fixed' speed limit.

Enabling the speed alert will <u>disable</u> the speed limiter function. Also the programmed Fixed Speed Limit will be disabled. Instead the Speed Alert will only warn the driver if the programmed speed limit is exceeded, but will not limit the vehicle speed. The speed alert can be programmed following the same procedure as described in figure 6.2. Alternatively the speed alert can also be programmed via the command module after pressing the ON key for more than 1 second.

Step 1: Enter the manual option adjustment mode. Press and hold the BRAKE pedal while pressing the **RES key 6 times** in quick succession. The Electronic

6.2.6 Manual GAIN Adjustment Mode (optional)

Low system gain is distinguished by sluggish throttle response when traveling up or down a hill. The result is excessive speed loss when climbing a hill or cresting the top. High system gain is distinguished by overactive adjustments and continuous surging.

Step 1: Enter the manual GAIN adjustment mode. Press and hold the BRAKE pedal while pressing the **RES key 4 times** in quick succession. The Electronic Module will respond with one Low tone beep for each press of the RES key. Release the BRAKE pedal and the Electronic Module will respond with 4 Hi tone beeps confirming the manual GAIN adjustment mode. If you hear the incorrect number of Hi tone beeps, repeat the BRAKE pedal and RES key sequence.

Step 2: To set the GAIN in this mode, drive the car at a convenient speed over 40Km/Hr and press the SET key to engage the cruise control.

Step 3: The GAIN setting range is between 3 and 14. Pressing the SET key to increase the GAIN will be responded by one Hi tone beep per count. Pressing the RES key to decrease the GAIN will be responded by one Low tone beep per count.

Excessive throttle motion indicates the gain is too high. Excessive overshoot of the final set speed indicates the gain is too low.

Step 4: When the Cruise Control's response has been adjusted to a satisfactory level, press the brake pedal to save the GAIN settings. The electronic module will respond with 4 beeps to confirm the saved settings. **See section 6.2.9 to exit SET-UP mode.**

6.2.7 Manual Fixed Limit Adjustment Mode (optional)

The Manual Fixed Limit adjustment mode allows programming of an absolute speed limit. The fixed speed limit will disable the driver from exceeding this programmed speed limit in all circumstances.

Step 1: Enter the manual fixed limit adjustment mode: Press and hold the BRAKE pedal while pressing the **RES key 5 times** in quick succession. The

When required, you can switch the product back to CAN mode by following the procedure described under 6.1.

Follow next paragraphs to complete the system set-up.

6.2.2 SETUP Mode Entry

To enter the SETUP mode, turn the vehicle ignition switch OFF, then ON again. Within 50 seconds, switch the cruise control ON, press and hold the BRAKE pedal while pressing the **SET** key 4 times in quick succession. The Electronic module will respond with 4 High tone beeps. See also the set-up flow chart on page 17-18 (Fig.6.3).

You must enter the above described SETUP mode first before selecting one of the following adjustment modes:

6.2.3 Manual Pedal Learning Mode (required!)

Step 1: Enter the manual Pedal-learning mode: Press and hold the BRAKE pedal the press the **RES** key 1 time. The Electronic Module will respond with 1 Low tone beep for each press of the RES key. Release the BRAKE pedal and the Electronic Module will respond with 1 High tone beep confirming the manual Pedal-learning mode is entered. **(**If you hear the incorrect number of High tone beeps, repeat the BRAKE pedal and RES key sequence**)**

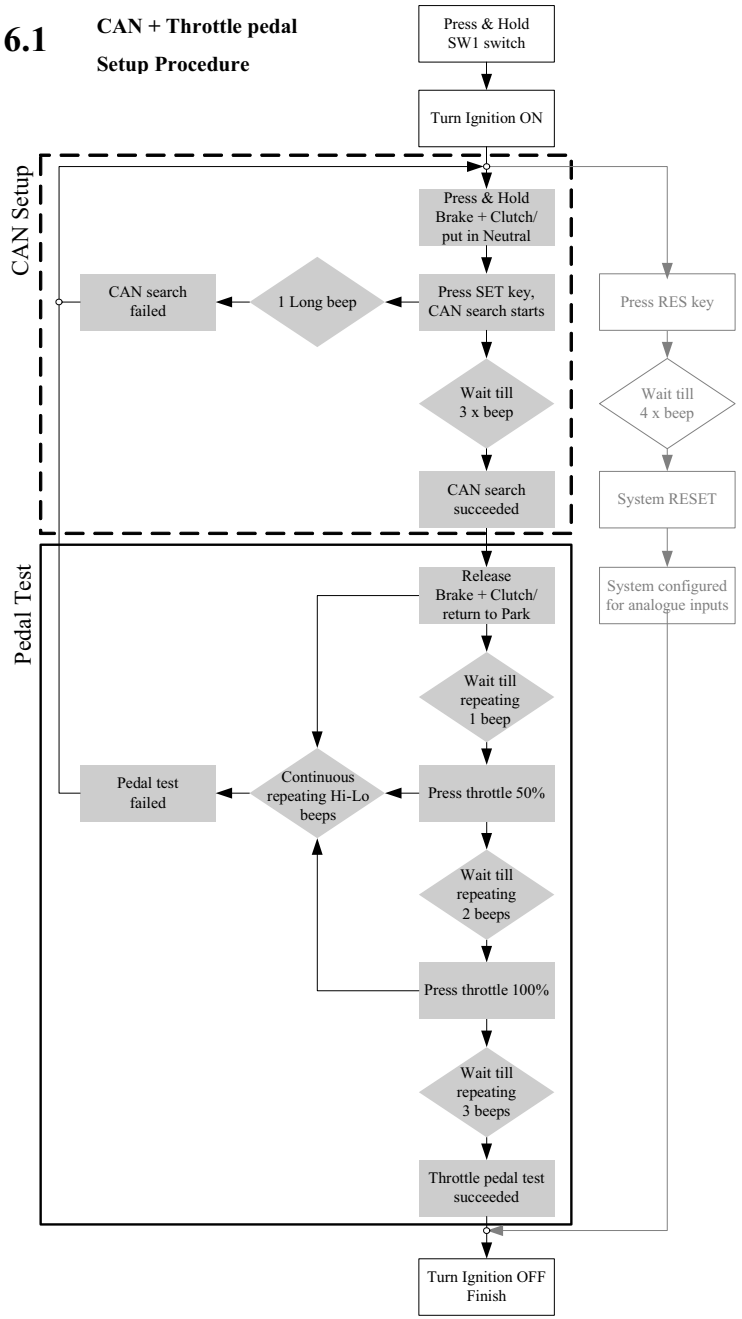
Step 2: Release the throttle pedal to idle position. Press the **SET** key 1 time to learn the throttle pedal idle position, the Electronic Module will respond with 1 High tone beep.

Step 3: Press and hold the throttle pedal to full travel position. Press the **RES** key 1 time to learn the throttle pedal at full travel position, the Electronics Module will respond with 1 High tone beep. If the throttle pedal is learned correctly, the Electronics Module will keep sounding Low tone beeps, else it will keep responding with High-Low-High-Low- tone beeps.

Step 4: Test the throttle pedal. Press and release the throttle pedal slowly. The Electronic Module should keep sounding Low beep tones only.

If the beep tone changes from Low to High or if it sounds continuous High-Low-High-Low- then repeat the Pedal Learning Procedure.

Fig. 6.1 **CAN + Throttle pedal Setup Procedure**



Step 3: To save the PPM and INIT and GAIN settings, press the BRAKE pedal. The Electronic Module will respond with 2 Hi tone beeps. Exit the SETUP mode by pressing the BRAKE pedal while pressing the SET key 4 times. See section 6.2.9 to exit SET-UP mode.
If required the following setup/learn procedures can be followed to adjust the main Cruise Control gain manually to optimize the Cruise Control performance.

6.2.5 Manual INIT Adjustment Mode (optional)

Low system init is distinguished by sluggish throttle response when pressing SET key to engage in cruise control mode on a normal road. The result is excessive speed loss from the beginning to engage. High system init is distinguished by overactive adjustments.

Step 1: Enter the manual INIT adjustment mode. Press and hold the BRAKE pedal while pressing the **RES key 3 times** in quick succession. The Electronic Module will respond with one Low tone beep for each press of the RES key. Release the BRAKE pedal and the Electronic Module will respond with 3 Hi tone beeps confirming the manual INIT adjustment mode. If you hear the incorrect number of Hi tone beeps, repeat the BRAKE pedal and RES key sequence.

Step 2: To set the INIT in this mode, drive the car at a convenient speed over 40Km/Hr and press the SET key to engage the cruise control.

Step 3: The INIT setting range is between 1 and 15. Pressing the SET key to increase the INIT will be responded by one Hi tone beep per count. Pressing the RES key to decrease the INIT will be responded by one Low tone beep per count.

Excessive throttle motion indicates the init is too high. Excessive overshoot of the beginning set speed indicates the init is too high.
Step 4: When the Cruise Control's response has been adjusted to a satisfactory level, press the brake pedal to save the INIT settings. The electronic module will respond with 3 beeps to confirm the saved settings.
See section 6.2.9 to exit SET-UP mode.

Step 5: If the throttle pedal is learned successfully, press the BRAKE pedal to save and exit the manual Pedal-learning mode. The Electronic Module will stop beeping. **See section 6.2.9 to exit SET-UP mode.**

⚠ Caution:

Some throttle pedals do not have consistent signal values near the full travel area. (presence of full-throttle switch). Therefore the learning procedure may not succeed. For this occasion repeat the learning procedure but press the throttle pedal not further than 95% of its full travel at step 3.

6.2.4 Auto PPM and INIT Adjustment Mode (required for Analogue mode)

The AUTO PPM adjustment mode allows a single procedure to set the PPM, INIT and GAIN (sensitivity parameters) settings to simplify the initial adjustment procedure. This procedure may be followed by any of the manual adjustment modes at a later date to fine-tune the parameter settings.

Step 1: Turn the gear in neutral or park position. Start the engine and enter Set-up mode again within 50 seconds after turning ignition on. Enter the AUTO PPM adjustment mode: Press and hold the BRAKE pedal and press the RES key 2 times. The Electronic Module will respond with one Low tone beep for each press of the RES key. Release the BRAKE pedal and 2 Hi tone beeps will confirm that the AUTO PPM set-up mode is entered. If you hear the incorrect number of Hi tone beeps, repeat the BRAKE pedal and RES key sequence.

Step 2: Drive the car at a speed of 72 Km/Hr or 45 MPH. Press the SET key. The cruise control will give 1 beep and will engage. If the cruise control is maintaining the speed accurate and fluently on the programmed speed then continue with step 3.

If the cruise control is losing the set speed then adjust the INIT value with the SET and RES keys. SET will increase and RES will decrease the initial value of the cruise control. The INIT setting range is between level 1 and 15. Pressing the SET key to increase the INIT will be responded by one Hi tone beep per count. Pressing the RES key to decrease the INIT will be responded by one Low tone beep per count.

Fig. 6.2 **Analogue Inputs Selection Procedure**

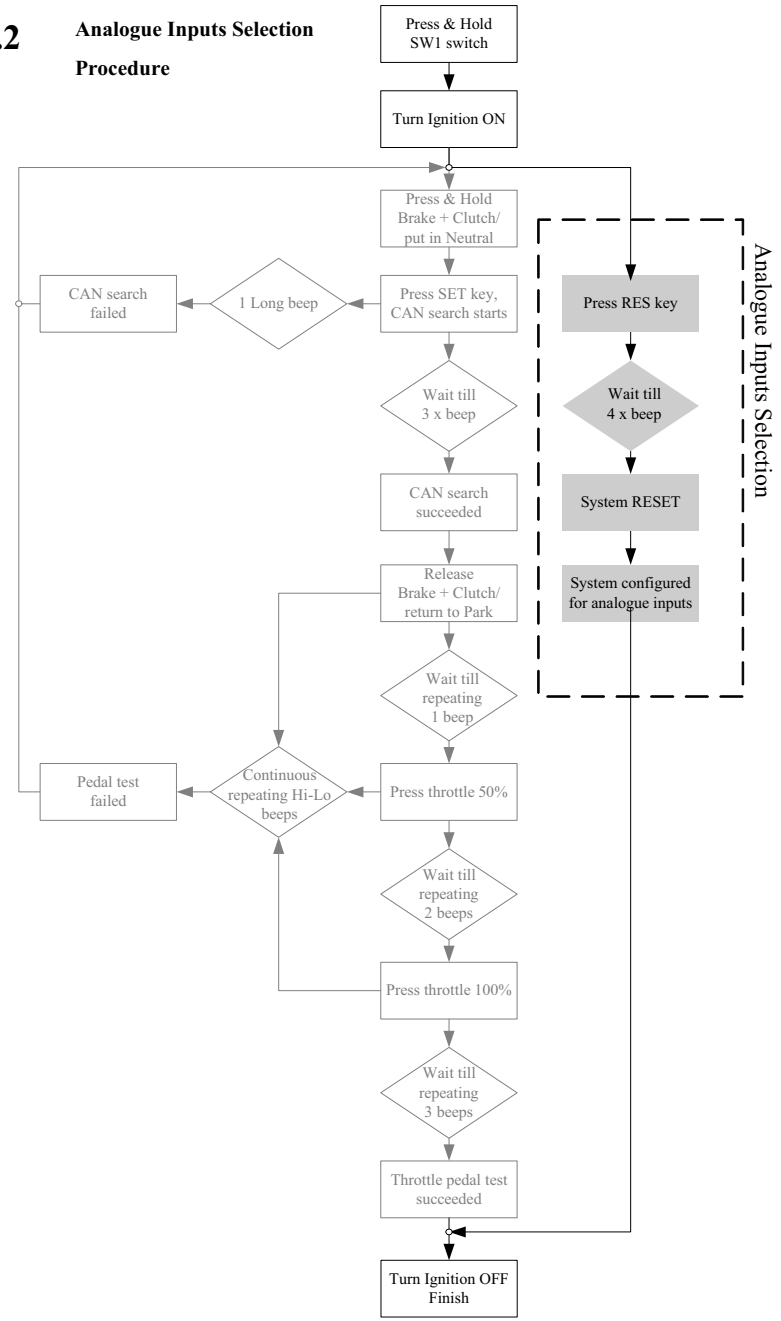
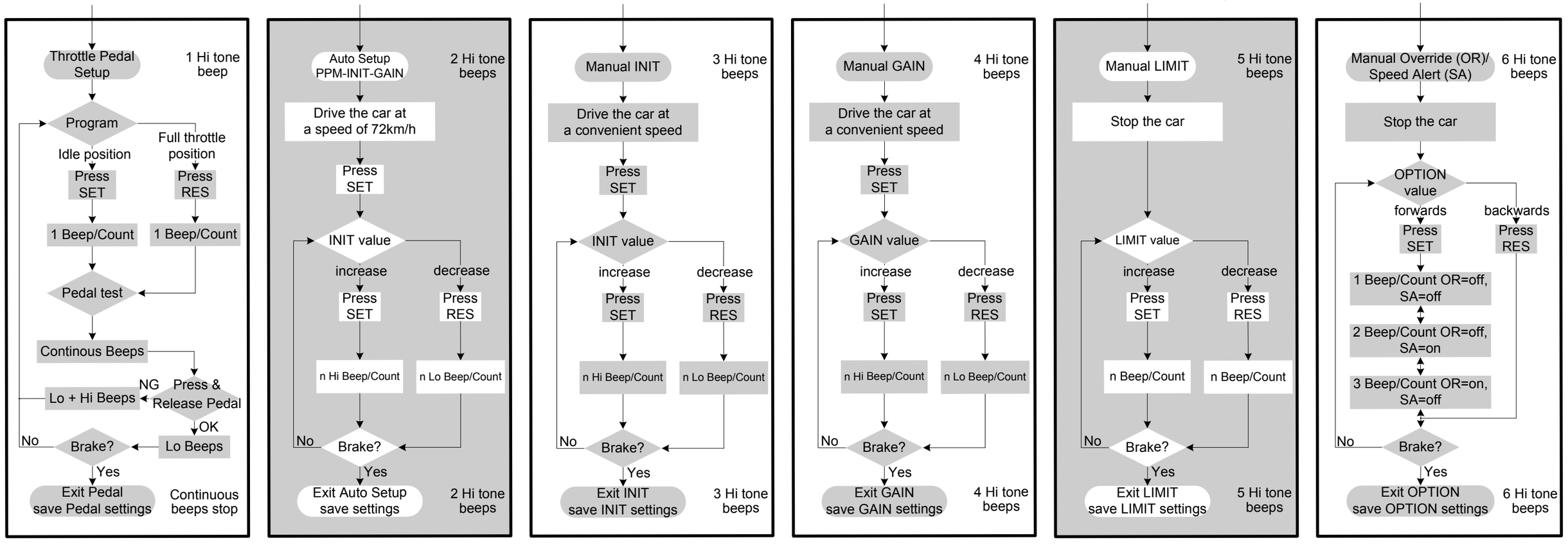


Fig. 6.3

Normal operation

Ignition switch ON
Press **ON** key **1x** (cruise control)
Press & hold brake pedal
Press **SET** key **4x** times

SETUP MODE



EXIT SETUP MODE - press & hold brake pedal, press SET key 4 x (1 Long Beep)